AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

1. (currently amended) A method of determining an average ~~for calibrating a flow meter having an array of sensors arranged in relation to a pipe that measures a~~ flow rate of a fluid flowing in the pipe~~, characterized in that the method comprises the step of~~ said method comprising:

measuring unsteady pressures using an array of sensors, wherein each sensor is spaced at different axial locations along the pipe;

determining, in response to the measured unsteady pressures, a measured flow rate of the fluid flow; and

relating the measured flow rate to the average flow rate of the fluid flow ~~calibrating the flow rate~~ using a calibration correction function based on ~~one or more~~ non-dimensional parameters that characterize ~~either~~ the array of sensors, the pipe, and the fluid flowing in the pipe~~, or some combination thereof.~~ to determine the average flow rate.

2. (currently amended) The ~~A~~ method according to claim 1, wherein the calibration correction function depends on ~~either~~ a ratio t/D of the pipe wall thickness (t) and the pipe inner diameter (D); a Reynolds number ~~$(\rho UD/\mu)$~~ that characterizes the fluid flow in the pipe; a ratio $\Delta x/D$ of the sensor spacing (Δx) and the pipe inner diameter (D); and a ratio $f\Delta x/U_{meas}$ of usable frequencies in relation to the sensor spacing (Δx) and the ~~raw~~ measured flow rate (U_{meas}). ~~; or some combination thereof.~~

3. (currently amended) The ~~A~~ method according to claim 1, ~~2, wherein the flow rate is a volumetric flow rate (Q) and the method~~ further includes ~~the step of~~ determining the average volumetric flow rate (Q) of the fluid flow based on the equation:

$$Q = A * U_{av},$$

where A is a cross sectional area of the pipe's inner diameter and U_{av} is ~~an~~ the average flow rate. ~~velocity.~~

4. (currently amended) The ~~A~~ method according to claim 3, wherein the ~~method~~ relating the measured flow rate to the average flow rate includes ~~the step of~~ determining the average flow rate ~~velocity~~ (U_{av}) based on the equation:

U_{av} = the calibration correction function * U_{meas}, where U_{meas} is a measured flow rate.

5. (canceled)

6. (canceled)

7. (currently amended) The ~~A~~ method according to claim 1, ~~6,~~ wherein the measured flow rate ~~velocity~~ of fluid flow is determined by measuring a slope of a convective ridge in a k-ω plane. ~~using a K-ω plot.~~

8. (currently amended) The ~~A~~ method according to claim 1, wherein the sensors of the array of sensors ~~includes an array of~~ include strain sensors or pressure sensors.

9. (canceled)

10. (canceled)

11. (currently amended) A flow meter for determining ~~having an array of sensors arranged in relation to a pipe that measures a~~ an average flow rate of a fluid flowing in the pipe, said flow meter comprising: ~~characterized in that~~

an array of sensors having an array of sensors for measuring unsteady pressures to determine a measured flow rate of the fluid, wherein each sensor is spaced at different axial locations along the pipe; and

a processor for relating the measured flow rate to the average flow rate of the fluid flow ~~the flow meter comprises a calibration correction function module that calibrates the flow rate~~ using a calibration correction function based on ~~one or more~~ non-dimensional parameters that characterize ~~either~~ array of sensors, the pipe, and the fluid flowing in the pipe to determine the average flow rate. ~~, or some combination thereof.~~

12. (currently amended) The ~~A~~ flow meter according to claim 11, ~~1,~~ wherein the calibration correction function depends on ~~either~~ a ratio t/D of the pipe wall thickness (t) and the pipe inner diameter (D); a Reynolds number ~~($\rho UD/\mu$)~~ that characterizes the fluid flow in the pipe; a ratio $\Delta x/D$ of the sensor spacing (Δx) and the pipe inner diameter (D); and a ratio $f\Delta x/U_{meas}$ of usable frequencies in relation to the sensor spacing (Δx) and the ~~raw~~ measured flow rate (U_{meas}). ~~; or some combination thereof.~~

13. (currently amended) The ~~A~~ flow meter according to claim 12, wherein the average flow rate is ~~a~~ an average volumetric flow rate (Q) and the processor ~~calibration correction function module~~ determines the average volumetric flow rate (Q) based on the equation:

$$Q = A * U_{av},$$

where A is a cross sectional area of the pipe's inner diameter and U_{av} is an average flow rate. ~~velocity.~~

14. (currently amended) The ~~A~~ flow meter according to claim 13, wherein the calibration correction function module determines the average flow velocity (U_{av}) based on the equation:

$$U_{av} = \text{the calibration correction function} * U_{meas},$$

where U_{meas} is a measured flow rate.

15. (canceled)

16. (canceled)

17. (currently amended) The ~~A~~ flow meter according to claim 11, ~~16,~~ wherein the ~~velocity~~ measured flow rate of fluid flow is determined by measuring a slope of a convective ridge in a k-ω plane. ~~using a K-ω plot.~~

18. (currently amended) The ~~A~~ flow meter according to claim 11, wherein the sensors of the array of sensors ~~includes an array of~~ include strain sensors or pressure sensors.

19. (canceled)

20. (canceled)

21. (new) The method according to claim 1, wherein the array of sensors include at least 3 sensors.

22. (new) The method according to claim 1, wherein the sensors are clamped onto the pipe.

23. (new) The method according to claim 1, wherein the calibration correction function depends on at least two of a ratio t/D of the pipe wall thickness (t) and the pipe inner diameter (D); a Reynolds number that characterizes the fluid flow in the pipe; a ratio $\Delta x/D$ of the sensor spacing (Δx) and the pipe inner diameter (D); and a ratio $f\Delta x/U_{meas}$ of usable frequencies in relation to the sensor spacing (Δx) and the measured flow rate (U_{meas}).

24. (new) The method according to claim 1, wherein the calibration correction function depends on a ratio t/D of the pipe wall thickness (t) and the pipe inner diameter (D).

25. (new) The method according to claim 1, wherein the calibration correction function depends on a ratio $\Delta x/D$ of the sensor spacing (Δx) and the pipe inner diameter (D).

26. (new) The method according to claim 1, wherein the calibration correction function depends on a ratio $f\Delta x/U_{meas}$ of usable frequencies in relation to the sensor spacing (Δx) and the measured flow rate (U_{meas}).

27. (new) The method according to claim 1, wherein the calibration correction function is defined by a calibration curve, the calibration curve being defined by an equation:

$$\text{Offset} = C_0 + C_1/RE^{C_2},$$

wherein Offset is the correction in percentage, RE is the Reynolds number of the fluid, and C_0, C_1 and C_2 are constants to define the calibration curve, which are related to the non-dimensional parameters.

28. (new) The method according to claim 27, wherein the average flow rate of the fluid flow in the pipe is determined by the equation:

$U_{av} = U_{meas} / (\text{Offset} + 1)$

wherein U_{av} is the average flow rate and U_{meas} is the measured flow rate.

29. (new) The method according to claim 1, wherein a common calibration correction function is used to determine the average flow rate for meters having similar sensor spacing, used on pipes having similar inner diameters and wall thickness, and measuring fluids having similar Reynolds numbers.

30. (new) The flow meter according to claim 11, wherein the measuring of the flow rate of a characteristic of the flow uses an array of sensor having at least 3 sensors disposed along the pipe at different axial locations.

31. (new) The flow meter according to claim 11, wherein the sensors are clamped onto the pipe.

32. (new) The flow meter according to claim 11, wherein the calibration correction function depends on at least two of a ratio t/D of the pipe wall thickness (t) and the pipe inner diameter (D); a Reynolds number that characterizes the fluid flow in the pipe; a ratio $\Delta x/D$ of the sensor spacing (Δx) and the pipe inner diameter (D); and a ratio $f\Delta x/U_{meas}$ of usable frequencies in relation to the sensor spacing (Δx) and the measured flow rate (U_{meas}).

33. (new) The flow meter according to claim 11, wherein the calibration correction function is defined by a calibration curve, the calibration curve being defined by an equation:

$\text{Offset} = C_0 + C_1/RE^{C}{}_{2}$,

wherein Offset is the correction in percentage, RE is the Reynolds number of the fluid, and C_0, C_1 and C_2 are constants to define the calibration curve, which are related to the non-dimensional parameters.

34. (new) The flow meter according to claim 33, wherein the average flow rate of the fluid flow in the pipe is determined by the equation:

$$U_{av} = U_{meas} / (\text{Offset} + 1)$$

wherein U_{av} is the average flow rate and U_{meas} is the measured flow rate.

35. (new) The flow meter according to claim 11, wherein a common calibration correction function is used to determine the average flow rate for meters having similar sensor spacing, used on pipes having similar inner diameters and wall thickness, and measuring fluids having similar Reynolds numbers.